

Cranial Nerve, Visual and Hearing Dysfunction in Disorders of the CNS

Condition: Cranial nerve injuries are common complications of traumatic brain injury due to trauma or other conditions. Injury of the nerves that affect the eyes and ears can cause dysfunction in vision and hearing.

Background: The 12 pairs of cranial nerves that emerge from the brain provide motor and sensory nerves to the head and neck. Injury to these nerves can occur due to skull fracture, brain bleeds, stroke, aneurysm, vascular blockage, tumors, meningitis, motor neuron disorders such as ALS, or demyelinating diseases such as multiple sclerosis.

Risk Factors: Head trauma and stroke are major risk factors for cranial nerve injury.

History and Symptoms: Most cranial nerve lesions are present at the time of traumatic brain injury, although some can develop later due to complications that arise following the injury. Symptoms can include loss of smell, taste, vision, and hearing as well as facial sensations, difficulty swallowing, gag reflex, problems speaking, and neck and shoulder muscle dysfunction. A history of trauma is critical for diagnosis.

Physical Exam: A physical exam will be utilized to evaluate the patient's symptoms and to identify the specific cranial nerve injury. Functional assessment of vision, hearing, balance, speaking, and swallowing will be conducted.

Diagnostic Process: Laboratory studies may be used to investigate an infection, autoimmune disease, or hormone disorders. CT is useful after trauma to evaluate fractures. Ethmoid tomography may be used if a fracture of the base of the skull is suspected, and MRI can be used to diagnose abnormalities in olfactory areas as well as tumors and multiple sclerosis. Nerve responses to sensory stimuli can be recorded, and EEG can be used in the case of seizures.

Rehab Management: Moderate recovery occurs within 4-6 weeks of trauma. Pain may be treated with medications, including anti-seizure drugs and antidepressants. Vision specialists, audiologists, and speech therapists will work together during rehabilitation. Vision problems may be treated with patching, prisms, or surgery, and visual training may lead to improvement in balance, dizziness, and posture. Medications to limit nausea can be used. Hearing aids and visual compensation can address hearing loss. No effective treatments are available for cranial nerve injury-induced loss of smell.

Other Resources for Patients and Families: Patients and families should be educated regarding safety considerations due to impaired vision or hearing, and support for family members may be available to aid in coping with changes in roles due to newfound disabilities.

Frequently Asked Questions

What is PM&R?

Physical medicine and rehabilitation (PM&R), also known as physiatry, is a primary medical specialty that aims to enhance and restore functional ability and improve quality of life to those with injuries, physical impairments or disabilities affecting the brain, spinal cord, nerves, bones, joints, ligaments, muscles and tendons. PM&R physicians, known as physiatrists, evaluate and treat the whole body, maximize patients' independence in their daily life and are experts in designing comprehensive, patient-centered treatment plans to empower patients to achieve their goals. By taking the whole body into account, they can accurately pin-point problems, decrease pain, assist in recovery from devastating injuries and maximize overall outcomes and performance with non-surgical and peri-surgical options. To learn more, visit www.aapmr.org/aboutpmr.

What makes PM&R physicians unique?

PM&R physicians' training focuses not just on treating medical conditions, but on enhancing the patient's performance and quality of life in the context of those medical conditions. They focus not only on one part of the body, but instead on the development of a comprehensive program for putting the pieces of a person's life back together – medically, socially, emotionally and vocationally – after injury or disease. PM&R physicians make and manage medical diagnoses, design a treatment plan and prescribe the therapies that physical therapists or other allied therapists perform or that are carried out by the patients themselves. By providing an appropriate treatment plan, PM&R physicians help patients stay as active as possible at any age. Their broad medical expertise allows them to treat disabling conditions throughout a person's lifetime.

Why see a PM&R physician?

A PM&R physician will thoroughly assess your condition, needs, and expectations and rule out any serious medical illnesses to develop a treatment plan. By understanding your condition and goals, you and your PM&R physician can develop a treatment plan suited to your unique needs.

How do I find a PM&R physician near me?

Visit www.aapmr.org/findapmrphysician or contact your primary care physician for a referral.